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Towards Poisson noise limited optical pump soft X-ray probe NEXAFS spectroscopy using a laser-produced plasma source: erratum

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Abstract: We provide corrections for our previous publication [Opt. Express **27**, 36524 (2019)].

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It was not correctly stated in [1] that the read out noise could not be reduced by averaging over multiple images. The read out noise n is reduced by 1/sqrt(N) if N is the number of images averaged. The measurement of the read out noise value of the CCD using 8x binning and 1 MHz was therefore measured incorrectly.

We have now measured the read out noise following the standard given by EMVA1288 (https://www.emva.org).

The read out noise n was measured to be 5.2e corresponding to 13 counts per pixel. In the data evaluation multiple counts are summed. This increases the noise in a square root behavior.

$$n' = \mathrm{sqrt}(x * n)$$

if x is the number of pixels summed up. For example x = 50, n = 1000 then n' equals 2.7 counts. This has only a negligible effect on the conclusion of the publication because of the low effect of the read out noise on the pump-probe NEXAFS spectra. We present an updated version of Table 1 that accounts for 24 h of measuring time instead of read out noise.

Table 1. Typical parameters obtained with 120 mJ and 1 ns, 150 nm thick 2 mm·2 mm Si_3N_4 windows, W target.

RZP structure	C K-edge	N K-edge	O K-edge	Cu L-edge	Mg K-edge
24 h measuring time limit	$2.0 \cdot 10^{-4}$	$1.2 \cdot 10^{-4}$	$1.2 \cdot 10^{-4}$	$2.4 \cdot 10^{-4}$	$5 \cdot 10^{-3}$
Mean photon cts/channel	700	2000	2000	500	1
Filter / nm	Ti 200	Ti 200	Al 200	Al 200	Al 1500

Also the reference number at the end of the following sentence on page 1 should be [4] and not [2]:

Using mid-infrared driving lasers for HHG even transition metal L-edges are accessible [4].

References

1. A. Jonas, H. Stiel, L. Glöggler, D. Dahm, K. Dammer, B. Kanngießer, and I. Mantouvalou, "Towards Poisson noise limited optical pump soft X-ray probe NEXAFS spectroscopy using a laser-produced plasma source," Opt. Express **27**(25), 36524–36537 (2019).

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